U.S. DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ASSESSMENT

For
Proposed Amendments to the 2014 Hunting Chapter
Of The
Visitor Service Plan
Clarence Cannon National Wildlife Refuge,
Annada, Missouri

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FOR
PROPOSED AMENDEMENTS TO 2014 HUNTING CHAPTER
OF THE
VISITOR SERVICE PLAN
CLARENCE CANNON NATIONAL WILDLIFE REFUGE

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1.0 PURPOSE OF THE PROPOSED ACTION

The Clarence Cannon National Wildlife Refuge (Refuge) was established by Congress in 1964 to protect and enhance habitat for migratory birds. The stated purposes for Clarence Cannon NWR include:

- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds...", 16 U.S.C. 715d (Migratory Bird Conservation Act)
- "... suitable for - (1) incidental fish and wildlife oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...", 16 U.S.C. 460k-1 (Refuge Recreation Act)

Other legislation that directs refuge management includes the National Wildlife Refuge System Administration Act (1966) as amended by the National Wildlife Refuge System Improvement Act (1997)16 U.S.C. 668dd-668ee. (Refuge Administration Act). This defines the National Wildlife Refuge System and authorizes the Secretary to permit any use of a refuge provided such use is compatible with the major purposes for which the refuge was established.

In 1997, Congress passed the landmark National Wildlife Refuge System Improvement Act, preparing the way for a renewed vision for the future of the refuge system where:

- Wildlife comes first
- Refuges are anchors for biodiversity and ecosystem-level conservation
- Lands and waters of the System are biologically healthy
- Refuge lands reflect national and international leadership in habitat management and wildlife conservation

The purpose of this Environmental Assessment (EA) is to evaluate alternatives for the purpose of updating the Hunting Chapter of the Refuge's Visitor Service Plan. The Service's Regional Director will review the recommendations assessed in this EA and select one of the Alternatives presented. The Regional Director also will determine whether this EA is adequate to support a Finding of No Significant Impact or whether an Environmental Impact Statement (EIS) will need to be prepared.

2.0 NEED FOR THE ACTION

The National Wildlife Refuge Improvement Act of 1997 (Improvement Act) directs refuges to provide six priority public uses when compatible with the purposes of the Refuge and the mission of the National Wildlife Refuge System (System). These priority uses include hunting,

fishing, wildlife photography, wildlife observation, environmental education, and interpretation. The need for action revolves around hunting as a priority use. The U.S. Fish and Wildlife Service (Service) guidance for implementing the Improvement Act not only encourages Refuge Managers to provide hunting where compatible but also to promote use of refuges for special hunts for youth, persons with disabilities, or other underserved hunting populations (605 FW 1.9C, 2.7M, 2.7N, USFWS, undated). Because hunting is one of six priority uses for the Refuge, the 2013 Hunting Chapter seeks to balance all of these uses over time and space.

Clarence Cannon National Wildlife Refuge located east of Annada, Missouri. Managed deer hunts are the only hunting activities allowed on the refuge. The Refuge proposes to continue managing the deer populations with these managed hunts. Changes to the Refuge's hunting program are published in the Federal Register and the Code of Federal Regulations (50 CFR 32.44) as needed.

To initiate or expand hunting programs, the Service must publish in the *Federal Register* any proposed and final Refuge-specific regulations pertaining to hunting prior to implementing them (605 FW 2.9, USFWS). The regulations are only one element of a complete opening package which is comprised of the following documents: Refuge Hunting Chapter; compatibility determination; documentation pursuant to compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, and appropriate NEPA decision document; Endangered Species Act Section 7 evaluation; copies of letters requesting State involvement and the results of the request; draft news release; outreach plan; and draft Refuge-specific regulations to be included in 50 CFR.

This Environmental Assessment serves as the NEPA document which analyzes the impacts of the proposed changes, or lack thereof, to the hunting program at Clarence Cannon National Wildlife Refuge for 2014 and beyond. The Hunt Plan provides information on the preferred alternative, the No Action Alternative. The Preferred Alternative, as presented in this EA, have been determined to be appropriate and compatible with the mission of the Refuge System and purposes for which the Refuge was established.

3.0 SCOPING AND PUBLIC PARTICIPATION

Consultation with MDC and other land managers for the development of this 2014 Hunting Chapter dates back to early 2000's when the Refuge began a series of formal and informal meetings to develop a vision for Refuge programs via the Comprehensive Conservation Plan (CCP) (USFWS 2004) process. Since then, the Refuge has continued informally consulting and coordinating with the State regarding Refuge hunting activities until a more formal effort was renewed in 2014 with the notification of the updated hunt plan.

Topics considered for the 2014 hunt plan include the following:

- Provide some type of hunting opportunity for the public.
- In areas adjacent to public dwellings and work spaces, limit hunting opportunities to provide for the safety. As a result, hunting opportunities would be limited to areas within the surrounding levee.

The Refuge solicited public comments on the Draft 2014 Hunting Chapter and EA. The drafts were made available for a 30 day review and comment period which extended from August 25, 2014 through September 25, 2014. The availability of these documents was announced via a public notice to print media organizations whose coverage extends beyond the geographic limits of the Refuge. The notice also was sent directly to legislators, municipal officials, agency contacts, and non-governmental organizations (see Section 8.0). The availability of the draft Hunting Chapter and EA were announced on the Service's Refuge website. Refuge staff was also available during the comment period to discuss the proposed Hunting Chapter and EA with any interested persons.

Following the Regional Director's review of the Hunting Chapter, this EA, and approval of the Finding of No Significant Impact, and other supporting documentation for opening hunting on the Refuge as described in the Preferred Alternative here, the Service will publish in the Federal Register a Proposed Rule that updates the hunting program on the Refuge. After the comment period closes for the Proposed Rule, a determination will be made whether to implement Refuge hunting as outlined in this Hunting Plan. Subsequently, a Final Rule will be published outlining hunting on the Refuge. The Refuge is officially open for the hunting opportunities described here only after the effective date of the final rule. Following these approvals, the Refuge Manager will annually review Refuge-specific hunting regulations and the Hunting Chapter to ensure continued compatibility and consistency of the visitor services program with existing laws and regulations.

4.0 PROPOSED ACTION AND THE ALTERNATIVES

One of the main purposes of the Refuge is to provide wildlife-dependent recreation and environmental education (Public Law 94-466; October 8, 1976). Hunting is a valuable means to meet this purpose. Toward that end, the Refuge has drafted an updated Hunting Chapter of its Visitor Services Plan. The 2014 Hunting Chapter seeks to maintain existing hunting opportunities on the Refuge. Proposed uses within this Chapter are appropriate and compatible with the mission and goals of the Refuge System and the purposes for which the Refuge was established (CCP, USFWS 2004).

The Service evaluated possible hunting program changes through two Alternatives:

(1) Only Managed Hunting Programs are Conducted on the Refuge (No Action, Preferred Action)
(2) Deer Hunting Programs are Open in Accordance With State Seasons and Regulations, No Managed Hunts

4.1 Alternatives Considered But Not Developed

A potential alternative was considered but not carried forward for detailed analysis because it would not enable the Refuge to fulfill the purposes for which it was established.

4.1.1 No Hunting

A No Hunting Alternative would require existing hunting to cease on the Refuge. Most lands presently managed as part of the Refuge were hunted prior to being included in the Refuge.

Numerous comments supporting the continuation of hunting were received during the scoping meetings for the EA as part of the Comprehensive Conservation Plan for the Mark Twain National Wildlife Refuge Complex (USFWS 2004).

The Improvement Act identifies hunting as one of six priority uses of lands within the Refuge System. To eliminate hunting on Refuge lands where it already has been determined to be compatible with Refuge purposes and the mission of the System would not meet the intent of the Improvement Act.

4.2 Alternatives Developed For Detailed Analysis

Two alternatives were carried forward for detailed analysis.

4.2.1 Elements Common to Developed Alternatives

Under both alternatives, hunting on the Refuge will be consistent with State regulations such as: (1) hunting hours, (2) license requirements, (3) possession rules and bag limits, (4) hunting equipment requirements, and (5) blaze orange.

Regulations pertaining to hunting on all National Wildlife Refuge System lands would remain in effect with each Alternative. These regulations are identified in Title 50 of the Code of Federal Regulations Section 32.2 and in the Refuge Hunting Plan associated with this document. Topics covered by these regulations include, but are not limited to, baiting and possession of alcohol.

Refuge-specific regulations also would apply to both alternatives. These regulations are identified in Title 50 of the Code of Federal Regulations Section 32.44 and in the Refuge Hunt Plan associated with this document. Refuge-specific topics include, but are not limited to, possession of alcohol and parking restrictions.

4.2.2 Alternative A: Only Managed Deer Hunting Programs are Conducted on the Refuge (No Action, Preferred Action)

Under this Alternative, the Refuge is open for managed deer hunts consistent with the Missouri Department of Conservation (MDC) regulations. All other hunting is prohibited.

The current hunting program generally allows specific hunting activities to enable the Refuge to balance species needs and other recreational uses with hunting activities. Maps identifying pertinent landmarks and Refuge unit hunting areas are provided in Appendix B, as noted.

4.2.3 Alternative B: Deer Hunting Programs are Open in Accordance With State Seasons and Regulations, No Managed Hunts

In this Alternative the Service is proposing to open Clarence Cannon NWR to state deer hunting seasons and regulations. All other hunting activities will not be allowed and managed hunts will be eliminated, including the Mobility and Visually Impaired hunt. In administering the hunts, the Refuge Manager will consider the biological effect of proposed hunting activities as well as the hunt's potential to conflict with concurrent non-hunting recreational activities.

Table 4.2.3.1 – General Comparison of Alternatives.

Action	Alternative A (Preferred action)	Alternative B
Species to be hunted	Big Game: white-tailed deer	No change
Locations of hunts	Clarence Cannon National Wildlife Refuge	No change
Huntable land base	3,468 ac. open for Refuge managed hunts out of 3,750 ac. of Refuge lands	No Change
Conflict between hunting and non-hunting activities	Conflicts with biological, non-hunting public use, or administrative activities mitigated by managed and temporal restrictions of activities.	Potential conflicts with biological, non-hunting public use, or administrative activities would be significant.

Table 4.2.3.2 - Comparison of Developed Alternatives

Refuge	Alternative A	Alternative B

Clarence Cannon National Wildlife Refuge	• Migratory Birds
	  ○ Closed to hunting migratory birds.
	• Upland Game
	  ○ Closed to hunting upland game.
	• Big Game
	  ○ Open only to special state-managed deer hunts.
	  ○ Closed to turkey hunting.
		• Migratory Birds
		  ○ Closed to hunting migratory birds.
		• Upland Game
		  ○ Closed to hunting upland game.
		• Big Game
		  ○ Open to deer hunting in accordance with state seasons and regulations. No managed hunts.
		  ○ Closed to turkey hunting

5.0 AFFECTED ENVIRONMENT

The Refuge is one of more than 556 refuges in the National Wildlife Refuge System (System). The mission of the System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish and wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (USFWS 1997). National Wildlife Refuges provide important habitat for native plants and many mammals, birds, fish, insects, amphibians, and reptiles. Refuges offer a wide variety of wildlife-dependent recreational opportunities and many have visitor centers, wildlife trails, and environmental education programs. Nationwide, about 40 million visitors annually hunt, fish, observe and photograph wildlife, or participate in educational and interpretive activities on refuge. The National Wildlife Refuge System is the most comprehensive system in the world of lands and waters managed specifically for the protection of wildlife and wildlife habitat.

The Refuge was established in 1964 by Congress through the Migratory Bird Conservation Act and the Refuge Recreation Act. The purposes of the Refuge are to (1) provide an inviolate

sanctuary for migratory birds; (2) provide for fish and wildlife-oriented recreation; (3) protect natural resources; and (4) conserve endangered or threatened species.

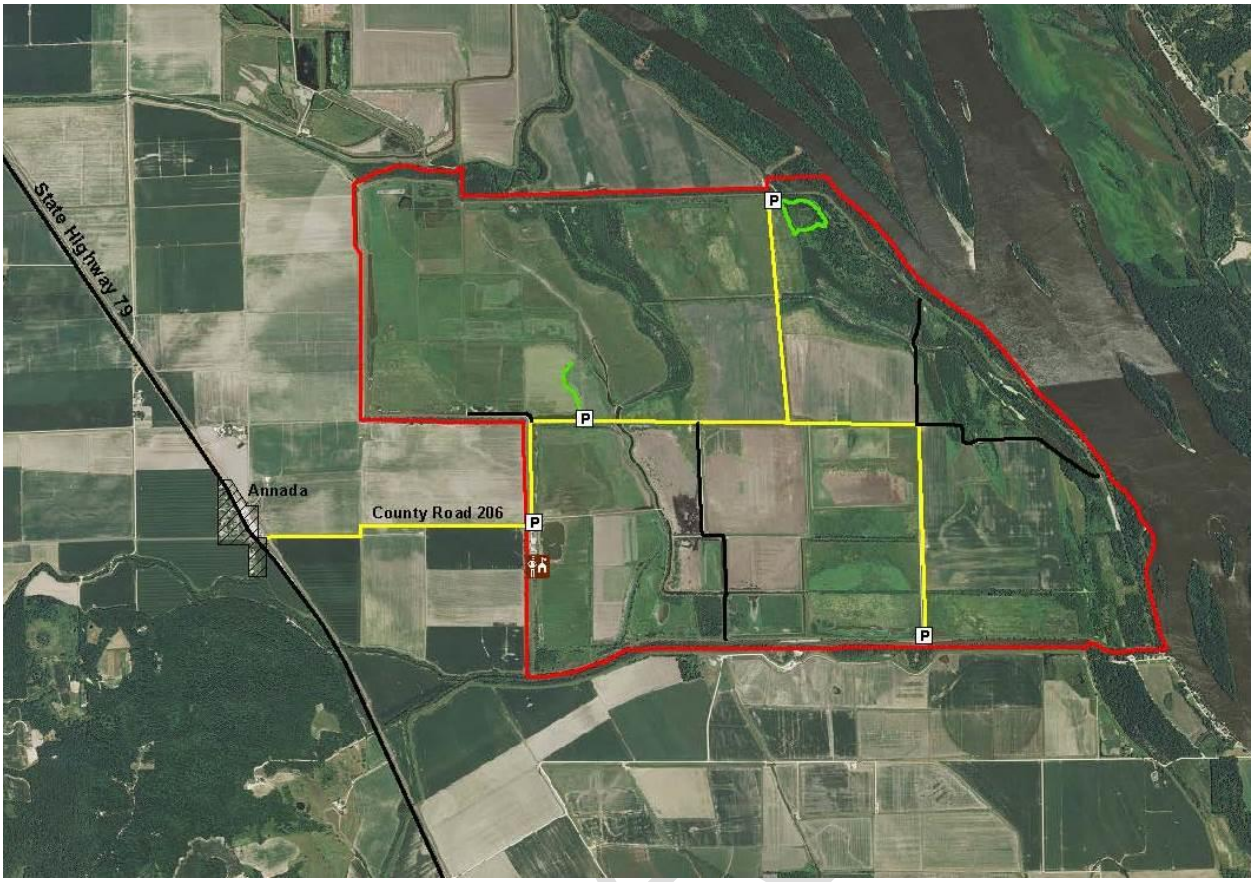
The current boundary of Clarence Cannon NWR encompasses 3,750 acres of floodplain habitat along the Mississippi River. The Refuge provides important habitat for migratory birds to rest, feed, and winter along the Mississippi Flyway. More than 200 different species of birds pass through this major flyway on their fall migration. The Refuge is located near lands owned by federal and state agencies, duck hunt clubs, and other private landowners, such as farmers.

5.1 Landscape Setting

The landscape encompassing Clarence Cannon NWR was formed during the Pleistocene epoch, or Ice Age, as continental ice sheets advanced and retreated across northern Missouri and Illinois. The southern extent of glaciations roughly parallels the Missouri River in Missouri. When the climate warmed again, meltwater from northern glacial ice created the present channel of the Illinois and Mississippi Rivers. Soils in the region have formed from wind deposited material that occurred during the ice sheet retreat.

The most dramatic change to the region was construction of Lock and Dam 25 and 26 across the Mississippi River near Winfield, Missouri and Alton, Illinois in late 1930's. After Lock and Dams were built, water levels in the Mississippi River adjacent to Clarence Cannon NWR were raised and stabilized. Prolonged flooding ultimately killed less water tolerant trees in floodplains.

The Refuge is located within a rural area of Missouri, approximately one mile east of the small town of Annada. The Refuge provides essential resting and feeding habitat for migrating birds along the Mississippi flyway in North America as they journey long distances to wintering and breeding grounds.



5.2 Natural Resources

5.2.1 Habitats

Clarence Cannon NWR is located within the 100-year floodplain of the Mississippi River. The area is found within the Prairie Parkland (Temperate) Province, Central Dissected Till Plains section, Mississippi River and Illinois Alluvial Plains Subsection (251Cf), as defined by Bailey (1983). The natural features include flat to level, moderately dissected rolling plains with historic oak-hickory and prairie vegetation communities. Elm-ash-cottonwood is the primary cover types along rivers.

The Mississippi River historically formed natural levees along the edges of bottomland lakes where floodplain forest vegetation established. The presence of these natural levees allow for the creation of natural wetlands and shallow lakes within the floodplain. In addition to these natural levees, some of the Refuges are separated from the river by man-made levees. In these cases, as with Clarence Cannon NWR, water levels are managed to restore the function of Refuge lands to conditions existing prior to human disturbance providing productive and important habitat to waterfowl and other waterbirds.

Clarence Cannon NWR contain a variety of wetlands ranging from shallow wet meadows and seasonally flooded emergent marshes to semi-permanent emergent marshes, scrub-shrub wetlands and bottomland forests. Water control structures are used to manage water levels in

units called moist-soil units to provide good quality production, brood rearing, feeding, or migration habitats for a host of resident and migratory species.

Floodplain forests historically dominated much of the floodplain along the Mississippi River and its tributaries. Today this plant community is found on the Refuge. Typical tree species found in these seasonally flooded areas include cottonwood (*Populus deltoids*), black willow (*Salix nigra*), silver maple (*Acer saccharinum*), sycamore (*Platanus occidentalis*), pin oak (*Quercus palustris*), persimmon (*Diospyros virginiana*), and pecan (*Carya illinoinensis*). Within the past couple decades, former Refuge croplands and open fields that were replanted with species typical of this community have been moderately successful.

Wet grassland and forb communities such as wet meadows, as well as seasonally flooded and semi-permanent marshes were also present along the Mississippi River. These areas were drained and converted to agricultural lands due to the rich, fertile soils. Management of these lands restored these natural communities for the benefit of resident and migratory wildlife.

The establishment of the Clarence Cannon National Wildlife Refuge, in conjunction with the other refuges along the Mississippi River, provides a vital resource for migratory birds. These lands offer important refuges in a sea of developed lands all along the river.

5.2.2 Wildlife

Migratory birds on the Refuge include both game and nongame species. The Mississippi River and adjacent bottomlands and uplands serve as a major migratory corridor for these birds as they travel between their breeding and wintering grounds. Since the inception of the Clarence Cannon National Wildlife Refuge, more than 280 species of birds have been observed.

This avian diversity is complemented by more than 100 known species of butterflies and moths and more than 60 species of reptiles and amphibians on the Refuge. Some of the more common species include southern leopard frog (*Rana [Lithobates] sphenocephala*), American toad (*Bufo americanus*), snapping turtle (*Chelydra serpentine*), red-eared slider turtle (*Trachemys scripta elegans*), spiney softshell turtle (*Apalone spinifera*), and the northern water snake (*Nerodia sipedon*). Little is known about herpetofauna populations or their limiting factors on the Refuge.

Upland game at the Clarence Cannon National Wildlife Refuge includes eastern cottontail rabbits (*Sylvilagus floridanus*), eastern fox squirrel (*Sciurus niger*), eastern gray squirrels (*Sciurus carolinensis*), and bobwhite quail (*Colinus virginianus*).

White-tailed deer (*Odocoileus virginianus*) and the Eastern wild turkey (*Meleagris gallopavo silvestris*) are the only big game species in the vicinity of the Refuge. The white-tailed deer represents one of the most important and popular big game mammals in Missouri.

Mammals attracted to river habitats include mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), river otter (*Lontra canadensis*), opossums (*Didelphis virginiana*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), bats (*Corynorhinus*, *Eptesicus*, *Lasionycteris*, *Lasiurus*, *Myotis*, *Nycticeius*, *Perimyotis*, *Pipistrellus*, and *Tadarida spp.*), and beaver (*Castor canadensis*). At most refuges, relatively high populations of beaver tend to complicate water

management activities. River otter, once nearly eliminated in this area, are now seen utilizing Refuge wetlands and river banks more frequently.

The Mississippi River and its tributaries are inhabited by an array of fish including game species such as sauger (*Sander canadensis*), largemouth bass (*Micropterus salmoides*), walleye (*Sander vitreus*), bluegill (*Lepomis macrochirus*), crappie (*Promoxis spp.*), and catfish (*Ictalurus spp.*). Other species include sturgeon (*Scaphirhynchus spp.*) and paddlefish (*Polyodon spathula*). Like most other fresh water systems in the United States, high populations of Asian carp inhabit the Mississippi River, its tributaries, and adjacent wetlands. The Asian carp are a nuisance since they threaten native species by competing for food and increasing the turbidity of the water they inhabit. Due to regular spring flooding, many of the Refuge wetlands contain a diversity of fish that originate in the river. For some species, such as crappie, these wetlands offer spawning and nursery habitat.

5.3 Threatened, Endangered, and Candidate Species

The Indiana bat (*Myotis sodalis*) and decurrrent false aster (*Boltonia decurrens*) are federally listed species in Pike County, Missouri. Clarence Cannon National Wildlife Refuge offers suitable habitat for the Indiana bat, but there are no records of roosting sites and/or nurseries present on the Refuge to date. Surveys conducted along the Mississippi River near Refuge lands, however, have documented their presence.

The threatened decurrent false aster is considered to have suitable habitat on Refuge lands in Pike County, Missouri. No plants have been found at the Refuge, but the closely related false aster (*Boltonia asteroids*) has been identified.

5.4 Cultural Resources

5.4.1 Archeology

Archeological sites are present in every county in which refuge is located. Some loss of resources can occur as a result of erosion or other natural processes, or from unauthorized collecting and vandalism. Collection and excavation of archeological material on refuge lands is permitted only when conducted in the public interest. The Regional Director regulates collection and excavation through the issuance of permits.

5.4.2 Historical Sites

Clarence Cannon National Wildlife Refuge has documented archaeological sites. There is the potential for more significant historical artifacts in and around the Refuge buried under the accumulation of sediments along the Mississippi River. Many artifacts are present at Native American campsites and where steamships wrecked on the hidden snags or shoals of the changing rivers. The amount of sediment carried by the river quickly buried and preserved these artifacts.

5.5 Economic Resources

The Refuge is located within 50 miles of the St. Louis, Missouri metropolitan area, home to 3 million people. It is the 18th largest metropolitan area in the country (US Census 2010). This heavily populated urban area has suburban and rural development areas. Socioeconomic conditions are wide ranging and

reflect the dynamic nature of development occurring along the Mississippi River. The refuge lies primarily in an area dominated by agriculture and private hunting clubs.

5.6 Recreational Opportunities

With the diversity of habitat and subsequent wildlife use, the Clarence Cannon National Wildlife Refuge provides many opportunities for outdoor recreation. The states of Missouri with their wide system of trails, campgrounds, and parks, have ample opportunities for outdoor recreation, as well. Missouri provides a diversity of travel, whether scenic driving, biking, hiking or enjoying one of the many water bodies throughout the state including two of North America's greatest rivers, the Missouri and Mississippi.

The headquarters to the Clarence Cannon National Wildlife Refuge is located one mile east of Annada, Missouri. Environmental education and interpretation opportunities are just a few of the activities provided from this facility. Wildlife-dependent uses, including wildlife photography, wildlife observation, as well as limited hunting and fishing opportunities are permitted uses on the Refuge. Dominant activities on the Refuge include wildlife observation, photography and interpretation.

Facilities available to the public during their visit include the visitor contact center from the hours of 7:30 a.m. to 4:00 p.m Monday through Friday. Interpretive displays, brochures, restrooms and more are available. The Refuge is open year round with parking lots, trails, auto tour routes, observation decks, and interpretive signs available to the public.

The State of Missouri with its parks, conservation areas and trails system offers many opportunities for outdoor recreation. Missouri also provides all kinds of travel, whether scenic driving, biking, hiking or enjoying one of the many water bodies throughout the state including North America's greatest river, the Mississippi.

5.7 Climate

The Clarence Cannon NWR climate is characterized by seasonal variations of hot, humid summers and cold winters. The average summer temperature is approximately 75° F and the average winter temperature is 31° F. Average total precipitation is 37.1" per year. The refuge annually receives an average of 19.8" of snow. In general, July is the warmest month with an average high temperature of 89° F while January is the coldest and driest month with lows averaging 21° F and only receiving 2.0" of precipitation. May is the wettest month with 3.9" of precipitation on average (www.weatherbase.com). Shallow waters in wetlands in the region typically are frozen from late November through mid-March; the first hard frosts and freezes usually occur in early to mid-October. Growing seasons average about 200 days annually.

Total annual precipitation in the region is slightly over 37 inches. Precipitation generally is low in winter. Summer storms are relatively common and daily rain totals of > 3-4 inches occur occasionally. Snow melt and increasing rain in early spring create local runoff into floodplain habitats. In addition to regular seasonal patterns of regional precipitation, the Mississippi River Valley has longer term patterns in annual precipitation and runoff that suggest peaks and lows that alternate on about a 20-year recurring interval.

Climate change is a concern that, depending on the accuracy of current assessments, could have major influences on the refuge. Like the rest of the world, much of the Midwest is already experiencing changes in temperature and precipitation. If these predictions are accurate, average temperatures and precipitation could continue to increase, resulting in longer growing seasons and increased flooding.

5.8 Physical Features

The present location of the Mississippi River and the geomorphic land forms reflect numerous channel changes and deposition/scouring events caused by fluvial dynamics and glacial events in the Quaternary period (Willman 1973, Simons et al. 1975). During pre-glacial times about 1 million years before the present (BP), the Iowa River occupied the current Mississippi River floodplain from about Muscatine, Iowa to Grafton, Illinois and the Mississippi River flowed south from Minnesota to Hennepin, Illinois where it then flowed through the current Illinois River valley. During the Kansas continental glaciation, much of the western drainage area of the current Upper Mississippi River watershed was diverted by ice through the current Illinois River valley and enlarged the valley greatly. Following the Kansas glaciations, the drainage reestablished a pre-glacial pattern with the ancient Mississippi River occupying the Illinois Valley and the ancestral Iowa River occupying the present Mississippi River Valley.

During the Illinoisan glaciations the glacial ice sheet advanced from the northeast and forced the ancient Mississippi River west; a lobe of ice advanced west and partly blocked the Mississippi Valley at St. Louis (Simons et al. 1975). This ice dam formed a large glacial lake in the current Mississippi/Illinois River confluence area and caused extensive deposition of alluvial material in the region. Following retreat of the Illinoisan ice during the Sangamonian interglacial period, the Mississippi River reoccupied the Illinois Valley and the Iowa River again passed through the present Mississippi River Valley.

The final advance of the Wisconsin ice sheet through the northern half of Illinois forced the Mississippi River into its present valley. The Illinois River, now draining a much reduced area, occupied the valley formed by the ancient Mississippi River. By the end of the Wisconsin glaciations, the current drainage patterns of the Upper Mississippi and Illinois rivers were established.

Clarence Cannon NWR is located in a large river floodplain and is subject to the extreme water fluctuations associated with a big river system.

5.9 Vegetation

The Refuge supports a variety of riverine, forest, and wetland ecosystems. Many of the ecosystems (and the habitats they support) have been degraded, damaged, or destroyed as a result of the numerous impacts previously cited, most notably the installation of locks and dams up and down the Mississippi River and the building of the levees. Despite these alterations, many of these impacted ecosystems have the potential to be restored through various management actions and specific projects.

The community types present at the refuge is greatly influenced by the River's hydrology and the topography of the adjacent terrestrial landscape. Figure 1 illustrates how the Refuge's natural communities vary based on the morphology of the River and its surrounding upland areas.

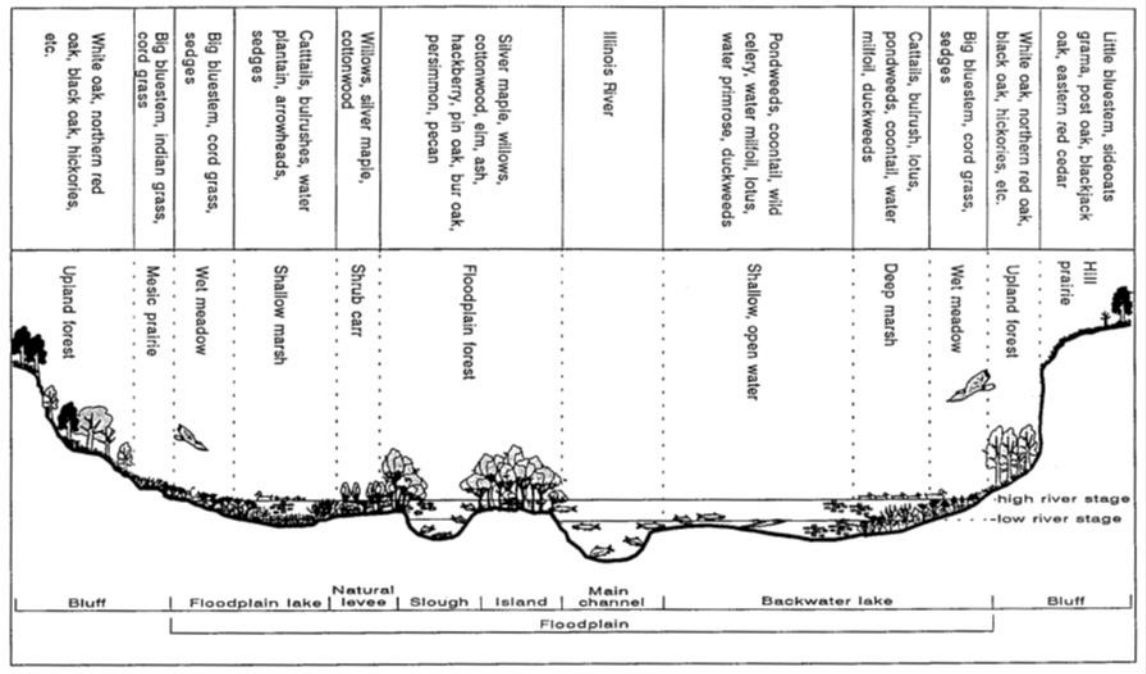


Figure 5. Cross-section of Habitat Types Typical in Mississippi River Valley (from Sparks 1993).

6.0 ENVIRONMENTAL CONSEQUENCES

This section evaluates the foreseeable environmental consequences of the alternatives described in Section 4.

6.1 Environmental Consequences of Alternative A: Only Managed Deer Hunting Programs are Conducted on the Refuge (No Action, Preferred Action)

This Alternative will not alter the current hunting program on Refuge lands. Presently managed deer hunts are conducted on Clarence Cannon NWR which follow state regulations with refuge specific restrictions.

6.1.1 Natural Resources

6.1.1.1 Habitats

The selection of this Alternative would not have significant adverse effects on the quality of wildlife habitat or the natural environment. The amount of habitat by type would not change from the current situation. With this Alternative, some minor trampling of vegetation from hunters using areas other than established trails is expected.

Access throughout Refuge units for hunting is typically by foot. On occasion the Refuge allows vehicles beyond parking lots or trailheads to facilitate accessible hunts. This is strictly regulated

by Special Use Permit (SUP). These permits restrict vehicles to existing trails, service roads, or designated routes and, therefore, cause no additional impacts to Refuge habitats.

Impacts to Refuge soils and vegetation by hunters are minimal. Hunting is conducted on foot mostly by individuals or small groups. Typically hunter groups travel in dispersed patterns so soil compaction and vegetation trampling will be minimal. During the Mobility and Visually Impaired hunt, hunters are taken to their blind with UTV or trucks on existing roads and trails. Therefore, soil compaction and vegetation trampling will be minimal.

Other potential types of habitat damage specifically attributed to hunting activities, such as littering, are not significant. Refuge specific regulations prohibit the cutting of vegetation, the use of screw-in steps on trees, and the use of campfires.

Populations of hunted species are not at levels that could cause habitat damage. Implementation of this Alternative would not change overall impacts on the habitat from wildlife. When populations are high, deer may damage habitat on the Refuge or on nearby public and private lands. Habitat damage on the Refuge and adjacent lands appears to be localized. The Refuge receives very few complaints of deer damage from adjacent landowners. Implementation of this Alternative would not change overall impacts on habitat from deer.

6.1.1.2 Wildlife

With this Alternative, given the restrictions of the managed deer hunts, disturbance of migratory birds, small game, and resident wildlife will be minimal. The harvest of deer will be in accordance with Federal regulations and Missouri state limits.

Hunting may have temporary, localized impacts to populations of game and non-game species. Some individuals and small groups of animals will be disturbed as hunters move through occupied habitat or discharge firearms. Disturbed animals will relocate to avoid hunters or flush and expend more energy than if they had remained at rest. Disturbance is not a long term threat to populations because the relocation is temporary and food is generally not a limiting factor. Most animals will be able to readily replace those energy reserves they use to escape from hunters.

Individual game animals will be removed from the population by hunter harvest. The impact of harvesting game animals is restricted through bag limits set by the state of Missouri and the restricted dates set by the refuge. These harvest limits are designed to meet population management objectives on the refuge in conjunction with the state.

Hunted Species

Under this Alternative, opportunities to hunt migratory birds (geese, ducks, coot, moorhens, rails, woodcock, common snipe, and mourning dove), upland game (i.e. pheasant, partridge, quail, rabbit, squirrel, woodchuck, raccoon, opossum, fox, coyote, bobcat, badger and skunk), and turkey are not permitted on the Refuge. With only managed deer hunts, minimal impacts to these species populations.

Deer are monitored and regulated by the State by evaluating hunter harvest and habitat conditions to ensure healthy populations throughout the state. Regulations, bag limits, and seasons are set as a result of the information gathered and analyzed annually. This information, along with Refuge specific monitoring and regulations ensures that hunting on the Refuge under this Alternative will not significantly impact hunted wildlife populations either locally or throughout the state.

Non- hunted Wildlife
Non-hunted wildlife include non-hunted migratory birds such as songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, and shrew; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory butterflies and moths, these species have very limited home ranges and hunting does not effectively impact their populations regionally.

Disturbance to non-hunted wildlife under this Alternative is minimal. Small mammals such as voles and mice are generally nocturnal or secretive. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor of cold-blooded reptiles and amphibians also limits their activity during most of the managed hunting seasons when temperatures are low. Some species of butterflies and moths are migratory and will not be present for most of the Refuge's hunts. Resident invertebrates are not active during cold weather and would have few interactions with hunters during the hunting season. Impacts to these species due to habitat disturbance related to hunting are negligible at the local and flyway levels.

Direct impacts to non-hunted non-migratory birds such as most woodpeckers and some songbirds including nuthatches, finches, and chickadees are negligible. Secondary impacts to this group of species are also minimal and do not appreciably reduce their numbers at the population level. Shorebirds would not be impacted by hunting, in most cases, since they have already migrated through the area prior to the fall hunting season. Disturbance by these managed hunts to non-hunted migratory birds would not have substantial negative secondary impacts because of the restricted dates which do not coincide with the nesting season. Other disturbance to these species by hunters afield would be temporary in nature. Overall the Refuge provides important resting and feeding areas for migratory birds even with the presence of the limited hunting activities.

Migratory birds of prey (eagles, hawks, etc.) are on the Refuge during hunting season. Disturbance to the daily wintering activities, such as feeding and resting, of residential birds might occur but are insignificant because such interactions are infrequent and of short duration when they do occur.

Overall, hunting impacts to non-hunted species and their habitats and impacts to the biological diversity of the Refuge will continue to be insignificant.

6.1.2 Recreational Opportunities
Under this Alternative, public use activities such as wildlife viewing, photography, interpretation and environmental education would be restricted during each managed hunt. Overall impacts

resulting from these restrictions would be minimal due to the limited number of days in which the managed hunts would take place.

Fishing would not be impacted as the activity is only permitted from boat on Byants Creek, an area off-limits to the hunters.

6.1.3 Cumulative impacts

6.1.3.1 Infrastructure

No infrastructure, on the Refuge or off the Refuge, will be modified solely to accommodate the Refuge's hunting program. Implementing a hunting program as described in this Alternative will have minimal direct or indirect impacts on public or private infrastructure. Therefore, there will be negligible cumulative impacts to the infrastructure at the local, regional, or national level due to administering the hunting program at the Clarence Cannon National Wildlife Refuge as described in this Alternative.

6.1.3.2 Natural Resources

Habitats

The Refuge Act identified the purposes for which the Refuge was established (Section 1.0). The Refuge's CCP (USFWS 2004) and HMP (USFWS 2012) further refines those purposes and identifies goals and strategies that would enable the Refuge to fulfill its mission. In implementing the CCP and the HMP, a step-down plan to the CCP, the Service conducts habitat management actions that favor healthy and functional ecological communities on Refuge lands. This approach benefits all wildlife species, including species traditionally hunted. Refuge habitats are not managed to favor hunted species over other species and are managed to maintain healthy populations of all species. In addition, Refuge regulations are devised to minimize any damage to habitats created by hunters and other Refuge visitors. The implementation of this Alternative does not result in significant direct, indirect, or cumulative effects to habitats at any scale due to hunting activities.

Hunted populations

Migratory Birds

Migratory game birds are those bird species so designated in conventions between the United States and several foreign nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the U.S. Fish and Wildlife Service as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing

migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each State and Province in that Flyway. The Clarence Cannon NWR is located in the Mississippi Flyway.

The process for adopting migratory game bird hunting regulations, located in 50 CFR part 20, is constrained by three primary factors. Legal and administrative considerations dictate how long the rule making process will last. Most importantly, however, the biological cycle of migratory game birds controls the timing of data-gathering activities and thus the dates on which these results are available for consideration and deliberation. The process of adopting migratory game bird hunting regulations includes two separate regulations-development schedules based on "early" and "late" hunting season regulations. Early hunting seasons pertain to all migratory game bird species in Alaska, Hawaii, Puerto Rico, and the Virgin Islands; migratory game birds other than waterfowl (e.g. dove, woodcock, etc.); and special early waterfowl seasons, such as teal or resident Canada geese. Early hunting seasons generally begin prior to October 1. Late hunting seasons generally start on or after October 1 and include most waterfowl seasons not already established. There are basically no differences in the processes for establishing either early or late hunting seasons. For each cycle, Service biologists and others gather, analyze, and interpret biological survey data and provide this information to all those involved in the process through a series of published status reports and presentations to Flyway Councils and other interested parties.

Because the Service is required to take an abundance of migratory birds and other factors in to consideration, the Service undertakes a number of surveys throughout the year in conjunction with the Canadian Wildlife Service, State and Provincial wildlife-management agencies, and others. To determine the appropriate framework for each species, the Service considers factors such as population size and trend, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest. After frameworks are established for season lengths, bag limits, and areas for migratory game bird hunting, migratory game bird management becomes a cooperative effort of State and Federal Governments. After Service establishment of final frameworks for hunting seasons, the States may select season dates, bag limits, and other regulatory options for the hunting seasons. States may always be more conservative in their selections than the Federal frameworks but never more liberal. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the State regulations. In fact, based upon the findings of an environmental assessment developed when a National Wildlife Refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the State allows. The waterfowl season on Clarence Cannon NWR will follow the frameworks set in place for Missouri.

NEPA considerations by the Service for hunted migratory game bird species are addressed by the programmatic document, ''Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FSES 88– 14),'' filed with the Environmental Protection Agency on June 9, 1988. We published Notice of Availability in the Federal Register on June 16, 1988 (53 FR 22582), and our Record of Decision on August 18, 1988 (53 FR 31341). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment, "Duck Hunting Regulations for 2006-07," and an August 24, 2006, Finding of No Significant Impact. Further, in a notice published in the

September 8, 2005, Federal Register (70 FR 53376), the Service announced its intent to develop a new Supplemental Environmental Impact Statement for the migratory bird hunting program. Public scoping meetings were held in the spring of 2006, as announced in a March 9, 2006, Federal Register notice (71 FR 12216). More information may be obtained from: Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Department of the Interior, MS MBSP-4107-ARLSQ, 1849 C Street, NWR., Washington, DC 20240.

Waterfowl

The Clarence Cannon NWR primarily provides spring and fall migration habitat for waterfowl. Wood ducks and Canada geese commonly nest in the Clarence Cannon NWR and there is a small amount of nesting by mallards and other species.

Breeding population estimates are made each year for 10 key species of ducks in the principal breeding areas of Alaska, Canada, and the north central United States. Surveys are conducted in May and early June by the Service, Canadian Wildlife Service, and provincial and state conservation agency personnel. Ducks are counted from fixed-wing aircraft on the same transects each year. Estimates of ducks and ponds seen from the air are corrected for visibility bias by conducting ground counts on a sample of the transects. Although numbers of breeding ducks have fluctuated substantially from year to year, trend analysis suggests that total duck numbers are stable. This stable trend, however, is the result of increasing numbers of some species (e.g., gadwall, green-winged teal, shovelers and blue-winged teal) and decreasing numbers of others (e.g., pintails and scaup). Despite the improvements in duck numbers in the 1990's, there are still concerns about the long-term loss of both wetland and upland habitat in the prairie pothole region and the long-term outlook for duck populations in the future. Duck populations have fluctuated substantially over time. Duck populations will continue to fluctuate in the future as the numbers of wetlands on the landscape in north-central North America rise and fall with the varying weather. Missouri does not report a population index of ducks for the state.

In the Migratory Bird Hunting Activity and Harvest during the 2010 and 2011 Hunting Seasons report (USFWS 2012), the Service estimates the following:

State	Measure	2010	2011
Missouri	Waterfowl Total Harvest	520,200 (±19%)	493,200 (±26%)
	Active Hunter Total	30,200 (±11%)	29,600 (±12%)
	Seasonal Duck Harvest Per Hunter	17.2	16.7

Summary

Even though the above numbers have been determined to support huntable waterfowl populations in Missouri, including the Clarence Cannon NWR, waterfowl hunting is not permitted on the Refuge. Therefore hunting under this Alternative will have no cumulative impacts to the waterfowl population.

Mourning Dove

In 1960, mourning dove management units were established to reflect populations that are largely independent of each other (USFWS 2012). Missouri is located in the Central

Management Unit (CMU). Population estimates of absolute abundance available since 2003 indicates there are about 308 million doves in the United States. Abundance during the last 5 years shows a declining population in the CMU. Even with the decline, the CMU has the highest population index of the three units.

Summary
During the 2011-12 season, Missouri ranked fourth in the CMU with a harvest of 296,600 doves by 23,800 hunters (Kulowiec 2013). With this Alternative, migratory bird is not permitted, therefore no cumulative impacts will result.

Other Hunted Migratory Birds
Other migratory birds include rails (sora and Virginia), American woodcock, Wilson's snipe and crow. All species inhabit wetlands and wet meadows found at the Clarence Cannon NWR either during migration, breeding and/or wintering times. Hunting of these species in Missouri is light compared to other migratory game birds. Harvest of these species on the Clarence Cannon NWR is not permitted, therefore no cumulative impacts will result.

Upland Game
Resident upland game populations are actively managed by the Missouri Department of Conservation. Through surveys and monitoring, the state develops density figures when determining each year's harvest needs to keep populations healthy. Habitat changes and weather may affect population numbers more than harvest. The number of hunters per square mile should stay about the same in the areas where Refuge lands are located. The wildlife populations on Refuge units should continue to reflect densities in the surrounding area.

Ring-necked pheasant
The ring-necked pheasant (*Phasianus colchicus*) is one of the upland game birds in Missouri. They conduct annual population counts and deem this population huntable. In Missouri, the 2012 Conservation Agents' Roadside Survey showed a statewide decline (49%) in the pheasant population from 2011; a 76% decline in the 5-year average (2007-2011); and a 90% decline for the 10-year average (2002-2012) (MDC 2012). Drought conditions during the survey are considered a factor, while loss of habitat continues to be a concern.

Clarence Cannon NWR provides very little habitat considered suitable for the ring-necked pheasant. Those individuals seen are more apt to be escaped birds from nearby game farms or hunt clubs rather than wild birds. Hunting of these birds is not permitted with this Alternative, so there will be no cumulative impacts.

Bobwhite Quail
The bobwhite quail (*Colinus virginianus*) is another upland game bird in Missouri where annual population counts are conducted and the populations are deemed huntable. In Missouri, the Northeast Riverbreaks zoogeographic region is where the Clarence Cannon NWR is located. Quail surveys in the northeast saw a 5.56% decrease in quail counted from 2011 to 2012 and a 16% reduction throughout the state. The 5-year and 10-year averages were also down by 52% and 60%, respectively. In 2012, the drought was considered a factor with reduced grass and shrub cover, hard and soft mast production, and surface water availability.

Clarence Cannon NWR provides only marginal habitat considered suitable for the bobwhite quail. Hunting of these species is not permitted with this Alternative, therefore there will be no cumulative impacts.

Rabbit (cottontail) and Squirrel Populations

Rabbit and squirrel hunting in the 2010-11 Missouri season showed no statistically significant differences compared to 2008-09 (Reitz 2011). Hunter success, estimated by bag per day, was relatively stable for squirrel hunting, but decreased for rabbit, while the average season bag remained relatively stable for all species.

Hunting for both rabbit and squirrel populations at the Clarence Cannon NWR is not permitted. As a result, no cumulative impacts will occur.

Coyote, Raccoon, and Fox Populations

The state of Missouri has a stable, huntable population of these species allowing for hunting and trapping. This Alternative only considers hunting of these species. Trapping on the Clarence Cannon NWR will be treated separately in a trapping management plan. The hunting of these species is dependent on the price of pelts in any given year. Weather also plays a part in harvest. Fox and coyote hunters are more successful during years with snow than in drier years.

Coyote hunters in Missouri increased significantly in the 2010-11 in comparison to 2008-09. No significant changes in hunter numbers were observed for the other species with a total of 129,391 hunters in 2010-11 which is slightly lower than the 133,626 hunters in 2008-09. The raccoon harvest declined 28.1% in 2010-11 from 2009-08. Coyote showed an increase of 29.4%. Red fox increased 53.2% and gray fox showed a 85.4% increase.

With the inability to hunt these species at the Clarence Cannon NWR, impacts to overall populations are not a factor.

Other Hunted Species

Missouri allows hunting of species covered under their upland/small game regulations. These species include gray partridge, woodchuck, opossum, bobcat, badger and striped skunk. Hunting of these species is not permitted with this Alternative, therefore there will have no cumulative impacts.

Big Game

The Missouri Department of Conservation actively manages resident big game populations, including wild turkey and deer. Through surveys and monitoring, the state develops density figures when determining each year's harvest needs to keep populations healthy. Habitat changes and weather may affect population numbers more than harvest. The number of hunters per square mile should stay about the same in the areas where Refuge lands are located. The wildlife populations on Refuge units should continue to reflect densities in the surrounding area.

Wild Turkey

Turkey populations are stable locally and throughout the state. There is no adverse impact to turkeys due to either hunting or non-hunting factors. Missouri has been conducting wild turkey

(*Meleagris gallopavo*) brood surveys annually since 1959 and providing success of each year's hatch (MDC 2012). The northeast region of the survey is where the Clarence Cannon NWR is located. In 2012, the northeast region reported 29% decrease in the poult-to-hen ratio from 2011; a 25% increase for a 5-year average; 15% increase for 10 years; and a 12% drop in 20 years. Statewide the percentage of change from 2011 was zero; a 42% increase in the 5-year average; 21% increase in 10 years; and a 6% decrease in 20 years.

With Clarence Cannon NWR closed to hunting turkey, cumulative impacts will not occur to the population.

White-tailed Deer
White-tailed deer in the vicinity of the Refuge move freely across property boundaries. In the vicinity of rural Refuge units deer population densities are relatively close to target densities compared to the more urban Refuge units where deer hunting is limited. Hunting on rural units may be contributing to overall population management goals - a desirable cumulative effect.

In the 2012-13 Missouri Deer Population Status Report and Deer Season Summary (MDC 2013) published by the Missouri Department of Conservation reports that white-tailed deer (*Odocoileus virginianus*) populations for northeast Missouri have been slowly declining over the last several years with dramatic declines experienced in a few counties, Pike County excluded. Even with the slow decline, resource scientists for MDC noted that Missouri has an abundance of deer with an estimated deer population of 1.4 million (MDC September 2013). The 2012 hemorrhagic disease outbreak is likely a result of the localized reductions in some areas, however recovery is expected to occur after a couple years.

With the overall deer populations in Missouri considered abundant and healthy, the average harvest of 50 deer on Clarence Cannon National Wildlife Refuge will have minimal effect on the populations.

Non-Hunted Species
Non-hunted migratory birds include songbirds, wading birds, raptors, and woodpeckers. Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects would not be applicable to species that do not migrate such as most woodpeckers, and some songbirds including nuthatches, finches, and chickadees. Disturbance from hunting to non-hunted migratory birds should not have cumulative negative impacts since the hunting seasons would not coincide with the nesting season, and disturbance to the daily wintering activities, such as feeding and resting, of birds would probably be similar to that caused by non-consumptive users.

Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Non-hunted wildlife would include small mammals such as voles, moles, mice, and shrews; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and

some species of migratory butterflies and moths, these species have very limited home ranges and hunting of allowed species would not affect their populations regionally.

Some species of butterflies and moths are migratory. Cumulative effects to these species at the "flyway" level should be negligible. These species are in torpor or have completely passed through the Clarence Cannon NWR by the hunting seasons in mid October and January. Any hunter interaction would be similar to that of non-consumptive users.

Disturbance to non-hunted wildlife would be unchanged under this Alternative. Significant disturbance would remain unlikely since small mammals are generally inactive during late November and early December and many of these species are nocturnal. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity when temperatures are low. Hunters rarely encounter reptiles and amphibians during most of the hunting season. Invertebrates are also not active during cold weather and have few interactions with hunters during the hunting season. Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

6.1.3.3 Threatened and Endangered Species

The Indiana bat, a Federally-listed endangered species, has not been documented on the Refuge, but has been observed using habitat along and adjacent to the Mississippi River. No changes to the hunting on the Refuge would have little or no cumulative impacts due to the time of the year for the activity.

Decurrent false aster (Boltonia decurrens), a federally threatened species, has potential suitable habitat at the Clarence Cannon National Wildlife Refuge in Pike County, Missouri. Impacts to this species will continue be minimal since hunting at the Clarence Cannon NWR is conducted in the fall and winter, outside of the growing season.

6.1.3.4 Cultural Resources

Refuge hunting activities will not affect cultural resources under either Alternative so there will be no cumulative impacts to such resources.

6.1.3.5 Social and Economic Resources

Due to no proposed changes in hunting under this Alternative, there is not an expected increase in economic activity associated with this Alternative. The current economic activity, while important to the communities near Refuge units (Section 6.1.5), is minor. Hunting activities under this Alternative does not produce significant cumulative effects.

The Refuge's presence increases the quality of life for some area residents. According to Refuge figures, in general, hunting accounts for more user visits than any of the other priority public uses, however at Clarence Cannon NWR, the priority public use is wildlife viewing. There are no other hunting-specific activities undertaken by the Service on the Refuge that have significant beneficial or adverse effects when compared to or combined with other socially important

activities in the area. Refuge hunting activities under this Alternative does not produce significant cumulative effects.

6.1.3.6 Recreational Opportunities

Managed hunting programs implemented under this Alternative evaluated by this EA will provide recreational opportunities for Refuge visitors. These opportunities, while fully appreciated by Refuge users wishing to hunt, are important in the urban context where public hunting opportunities are limited. In a regional or statewide context, hunting on the Refuge units provides only a small percentage of hunting opportunities.

Non-hunting wildlife-dependent recreational opportunities are the priority public use on Clarence Cannon NWR and are available on a variety of other public or private lands locally. There are eight National Wildlife Refuges in Missouri. Thousands of other public spaces in the state provide a variety of wildlife habitat suitable for fishing, wildlife observation, photography, environmental education, and interpretation activities. Hunting programs at the Refuge under this Alternative will not result in significant adverse effects at any scale, either by themselves or when combined with non-service actions due to the limited days of available hunting on the Refuge.

6.1.3.7 Anticipated Impacts if Individual Hunts are Allowed to Accumulate

National Wildlife Refuges, including Clarence Cannon NWR, conduct hunting programs within the framework of state and federal regulations. By maintaining hunting regulations that are consistent with, or more restrictive than the State, individual refuges are maintaining seasons that are supportive of state and federal resource management goals. This Alternative would not increase the amount of hunting opportunity on Clarence Cannon NWR, therefore would not have any increased impact.

6.2 Environmental Consequences of Alternative B: Deer Hunting Programs are Open in Accordance With State Seasons and Regulations, No Managed Hunts

This Alternative will open Refuge lands to State deer seasons and regulations with minor refuge specific restrictions, such as specified closed areas. Due to the conflicts with the ongoing deer seasons, managed deer hunts will be illuminated, including the Mobility and Visually Impaired hunt.

6.2.1 Natural Resources

6.2.1.1 Habitats

The selection of this Alternative would not have significant adverse effects on the quality of wildlife habitat or the natural environment. The amount of habitat by type would not change from the current situation. With this Alternative, trampling of vegetation from hunters using areas other than established trails is expected. Impacts to Refuge soils and vegetation by hunters are minimal. Hunting is conducted on foot mostly by individuals or small groups. Typically hunter groups travel in dispersed patterns so soil compaction and vegetation trampling will be minimal.

Other potential types of habitat damage specifically attributed to hunting activities, such as littering, are not significant. Refuge specific regulations prohibit the cutting of vegetation, the use of screw-in steps on trees, and the use of campfires.

Populations of hunted species are not at levels that could cause habitat damage. Implementation of this Alternative would not change overall impacts on the habitat from wildlife. When populations are high, deer may damage habitat on the Refuge or on nearby public and private lands. Habitat damage on the Refuge and adjacent lands appears to be localized. The Refuge receives very few complaints of deer damage from adjacent landowners. Implementation of this Alternative would not change overall impacts on habitat from deer.

6.2.1.2 Wildlife

With this Alternative, disturbance of small game and resident wildlife will be minimal. In contrast, the impacts to waterfowl migrating when deer and waterfowl seasons coincide will result in significant impacts to the waterfowl use on the Refuge from hunting activities. The harvest of deer with this Alternative will be in accordance with Federal regulations and Missouri state limits.

Hunting may have temporary, localized impacts to populations of game and non-game species, with the exception of waterfowl during the waterfowl hunting season. Some individuals and small groups of animals will be disturbed as hunters move through occupied habitat or discharge firearms. Disturbed animals will relocate to avoid hunters or flush and expend more energy than if they had remained at rest. Disturbance is not a long term threat these populations because the relocation is temporary and food is generally not a limiting factor. Most animals will be able to readily replace those energy reserves they use to escape from hunters.

As for waterfowl, Clarence Cannon NWR provides a vital sanctuary for migratory waterfowl at a local level due to the pressures from hunting throughout the surrounding landscape. Disturbance from deer hunters during the waterfowl season would significantly impact waterfowl use on the Refuge and the surrounding waterfowl hunting. The birds would move on to other areas where disturbance will be minimal, allowing them to replenish the energy expended from their long journey.

Individual game animals will be removed from the population by hunter harvest. The impact of harvesting game animals is restricted through bag limits set by the state of Missouri and the restricted dates set by the refuge. These harvest limits are designed to meet population management objectives on the refuge in conjunction with the state.

Hunted Species

Under this Alternative, opportunities to hunt migratory birds (geese, ducks, coot, moorhens, rails, woodcock, common snipe, and mourning dove), upland game (i.e. pheasant, partridge, quail, rabbit, squirrel, woodchuck, raccoon, opossum, fox, coyote, bobcat, badger and skunk), and turkey are not permitted on the Refuge. With only managed deer hunts, there will be minimal impacts to these species populations.

Deer are monitored and regulated by the State by evaluating hunter harvest and habitat conditions to ensure healthy populations throughout the state. Regulations, bag limits, and seasons are set as a result of the information gathered and analyzed annually. This information, along with Refuge specific monitoring and regulations ensures that hunting on the Refuge under this Alternative will not significantly impact hunted wildlife populations either locally or throughout the state.

Non- hunted Wildlife

Non-hunted wildlife include non-hunted migratory birds such as songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, and shrew; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory butterflies and moths, these species have very limited home ranges and hunting does not effectively impact their populations regionally.

Disturbance to non-hunted wildlife under this Alternative is minimal. Small mammals such as voles and mice are generally nocturnal or secretive. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor of cold-blooded reptiles and amphibians also limits their activity during most of the managed hunting seasons when temperatures are low. Some species of butterflies and moths are migratory and will not be present for most of the Refuge's hunts. Resident invertebrates are not active during cold weather and would have few interactions with hunters during the hunting season. Impacts to these species due to habitat disturbance related to hunting are negligible at the local and flyway levels.

Direct impacts to non-hunted non-migratory birds such as most woodpeckers and some songbirds including nuthatches, finches, and chickadees are negligible. Secondary impacts to this group of species are also minimal and do not appreciably reduce their numbers at the population level. Shorebirds would not be impacted by hunting, in most cases, since they have already migrated through the area prior to the fall hunting season. Disturbance by these managed hunts to non-hunted migratory birds would not have substantial negative secondary impacts because of the restricted dates which do not coincide with the nesting season. Other disturbance to these species by hunters afield would be temporary in nature. Overall the Refuge provides important resting and feeding areas for migratory birds even with the presence of the limited hunting activities.

Migratory birds of prey (eagles, hawks, etc.) are on the Refuge during hunting season. Disturbance to the daily wintering activities, such as feeding and resting, of residential birds might occur but are insignificant because such interactions are infrequent and of short duration when they do occur.

Overall, hunting impacts to non-hunted species and their habitats and impacts to the biological diversity of the Refuge will continue to be insignificant.

6.2.2 Recreational Opportunities

Under this Alternative, public use activities such as wildlife viewing, photography, interpretation and environmental education would be restricted during each managed hunt. Overall impacts resulting from these restrictions would be minimal due to the limited number of days in which the managed hunts would take place.

Fishing would not be impacted as the activity is only permitted from boat on Byants Creek, an area off-limits to the hunters.

6.2.3 Cumulative impacts

6.2.3.1 Infrastructure

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6.2.3.2 Natural Resources

Habitats

The Refuge Act identified the purposes for which the Refuge was established (Section 1.0). The Refuge's CCP (USFWS 2004) and HMP (USFWS 2012) further refines those purposes and identifies goals and strategies that would enable the Refuge to fulfill its mission. In implementing the CCP and the HMP, a step-down plan to the CCP, the Service conducts habitat management actions that favor healthy and functional ecological communities on Refuge lands. This approach benefits all wildlife species, including species traditionally hunted. Refuge habitats are not managed to favor hunted species over other species and are managed to maintain healthy populations of all species. In addition, Refuge regulations are devised to minimize any damage to habitats created by hunters and other Refuge visitors. The implementation of this Alternative does not result in significant direct, indirect, or cumulative effects to habitats at any scale due to hunting activities.

Hunted populations

Migratory Birds

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Service as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each State and Province in that Flyway. The Clarence Cannon NWR is located in the Mississippi Flyway.

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Waterfowl

The Clarence Cannon NWR primarily provides spring and fall migration habitat for waterfowl. Wood ducks and Canada geese commonly nest in the Clarence Cannon NWR and there is a small amount of nesting by mallards and other species.

Breeding population estimates are made each year for 10 key species of ducks in the principal breeding areas of Alaska, Canada, and the north central United States. Surveys are conducted in May and early June by the Service, Canadian Wildlife Service, and provincial and state conservation agency personnel. Ducks are counted from fixed-wing aircraft on the same transects each year. Estimates of ducks and ponds seen from the air are corrected for visibility bias by conducting ground counts on a sample of the transects. Although numbers of breeding ducks have fluctuated substantially from year to year, trend analysis suggests that total duck numbers are stable. This stable trend, however, is the result of increasing numbers of some species (e.g., gadwall, green-winged teal, shovelers and blue-winged teal) and decreasing numbers of others (e.g., pintails and scaup). Despite the improvements in duck numbers in the 1990's, there are still concerns about the long-term loss of both wetland and upland habitat in the prairie pothole region and the long-term outlook for duck populations in the future. Duck populations have fluctuated substantially over time. Duck populations will continue to fluctuate in the future as the numbers of wetlands on the landscape in north-central North America rise and fall with the varying weather. Missouri does not report a population index of ducks for the state.

In the Migratory Bird Hunting Activity and Harvest during the 2010 and 2011 Hunting Seasons report (USFWS 2012), the Service estimates the following:

State	Measure	2010	2011
Missouri	Waterfowl Total Harvest	520,200 (±19%)	493,200 (±26%)
	Active Hunter Total	30,200 (±11%)	29,600 (±12%)
	Seasonal Duck Harvest Per Hunter	17.2	16.7

Summary

Even though the above numbers have been determined to support huntable waterfowl populations in Missouri, including the Clarence Cannon NWR, waterfowl hunting is not permitted on the Refuge. Even with the absence of waterfowl hunting, this Alternative would have a direct impact on waterfowl use on the Refuge during their migration due to the

disturbance from deer hunters. Overall cumulative impacts to the waterfowl population however would be minimal as they would seek refuge elsewhere.

Mourning Dove
In 1960, mourning dove management units were established to reflect populations that are largely independent of each other (USFWS 2012). Missouri is located in the Central Management Unit (CMU). Population estimates of absolute abundance available since 2003 indicates there are about 308 million doves in the United States. Abundance during the last 5 years shows a declining population in the CMU. Even with the decline, the CMU has the highest population index of the three units.

Summary
During the 2011-12 season, Missouri ranked fourth in the CMU with a harvest of 296,600 doves by 23,800 hunters (Kulowiec 2013). With this Alternative, migratory bird is not permitted, therefore no cumulative impacts will result.

Other Hunted Migratory Birds
Other migratory birds include rails (sora and Virginia), American woodcock, Wilson's snipe and crow. All species inhabit wetlands and wet meadows found at the Clarence Cannon NWR either during migration, breeding and/or wintering times. Hunting of these species in Missouri is light compared to other migratory game birds. Harvest of these species on the Clarence Cannon NWR is not permitted, therefore no cumulative impacts will result.

Upland Game
Resident upland game populations are actively managed by the Missouri Department of Conservation. Through surveys and monitoring, the state develops density figures when determining each year's harvest needs to keep populations healthy. Habitat changes and weather may affect population numbers more than harvest. The number of hunters per square mile should stay about the same in the areas where Refuge lands are located. The wildlife populations on Refuge units should continue to reflect densities in the surrounding area.

Ring-necked pheasant
The ring-necked pheasant (*Phasianus colchicus*) is one of the upland game birds in Missouri. They conduct annual population counts and deem this population huntable. In Missouri, the 2012 Conservation Agents' Roadside Survey showed a statewide decline (49%) in the pheasant population from 2011; a 76% decline in the 5-year average (2007-2011); and a 90% decline for the 10-year average (2002-2012) (MDC 2012). Drought conditions during the survey are considered a factor, while loss of habitat continues to be a concern.

Clarence Cannon NWR provides very little habitat considered suitable for the ring-necked pheasant. Those individuals seen are more apt to be escaped birds from nearby game farms or hunt clubs rather than wild birds. Hunting of these birds is not permitted with this Alternative, so there will be no cumulative impacts.

Bobwhite Quail
The bobwhite quail (*Colinus virginianus*) is another upland game bird in Missouri where annual population counts are conducted and the populations are deemed huntable. In Missouri, the

Northeast Riverbreaks zoogeographic region is where the Clarence Cannon NWR is located. Quail surveys in the northeast saw a 5.56% decrease in quail counted from 2011 to 2012 and a 16% reduction throughout the state. The 5-year and 10-year averages were also down by 52% and 60%, respectively. In 2012, the drought was considered a factor with reduced grass and shrub cover, hard and soft mast production, and surface water availability.

Clarence Cannon NWR provides only marginal habitat considered suitable for the bobwhite quail. Hunting of these species is not permitted with this Alternative, therefore there will be no cumulative impacts.

Rabbit (cottontail) and Squirrel Populations

Rabbit and squirrel hunting in the 2010-11 Missouri season showed no statistically significant differences compared to 2008-09 (Reitz 2011). Hunter success, estimated by bag per day, was relatively stable for squirrel hunting, but decreased for rabbit, while the average season bag remained relatively stable for all species.

Hunting for both rabbit and squirrel populations at the Clarence Cannon NWR is not permitted. As a result, no cumulative impacts will occur.

Coyote, Raccoon, and Fox Populations

The state of Missouri has a stable, huntable population of these species allowing for hunting and trapping. This Alternative only considers hunting of these species. Trapping on the Clarence Cannon NWR will be treated separately in a trapping management plan. The hunting of these species is dependent on the price of pelts in any given year. Weather also plays a part in harvest. Fox and coyote hunters are more successful during years with snow than in drier years.

Coyote hunters in Missouri increased significantly in the 2010-11 in comparison to 2008-09. No significant changes in hunter numbers were observed for the other species with a total of 129,391 hunters in 2010-11 which is slightly lower than the 133,626 hunters in 2008-09. The raccoon harvest declined 28.1% in 2010-11 from 2009-08. Coyote showed an increase of 29.4%. Red fox increased 53.2% and gray fox showed a 85.4% increase.

With the inability to hunt these species at the Clarence Cannon NWR, impacts to overall populations are not a factor.

Other Hunted Species

Missouri allows hunting of species covered under their upland/small game regulations. These species include gray partridge, woodchuck, opossum, bobcat, badger and striped skunk. Hunting of these species is not permitted with this Alternative, therefore there will have no cumulative impacts.

Big Game

The Missouri Department of Conservation actively manages resident big game populations, including wild turkey and deer. Through surveys and monitoring, the state develops density figures when determining each year's harvest needs to keep populations healthy. Habitat changes

and weather may affect population numbers more than harvest. The number of hunters per square mile should stay about the same in the areas where Refuge lands are located. The wildlife populations on Refuge units should continue to reflect densities in the surrounding area.

Wild Turkey
Turkey populations are stable locally and throughout the state. There is no adverse impact to turkeys due to either hunting or non-hunting factors. Missouri has been conducting wild turkey (*Meleagris gallopavo*) brood surveys annually since 1959 and providing success of each year's hatch (MDC 2012). The northeast region of the survey is where the Clarence Cannon NWR is located. In 2012, the northeast region reported 29% decrease in the poult-to-hen ratio from 2011; a 25% increase for a 5-year average; 15% increase for 10 years; and a 12% drop in 20 years. Statewide the percentage of change from 2011 was zero; a 42% increase in the 5-year average; 21% increase in 10 years; and a 6% decrease in 20 years.

With Clarence Cannon NWR closed to hunting turkey, cumulative impacts will not occur to the population.

White-tailed Deer
White-tailed deer in the vicinity of the Refuge move freely across property boundaries. In the vicinity of rural Refuge units deer population densities are relatively close to target densities compared to the more urban Refuge units where deer hunting is limited. Hunting on rural units may be contributing to overall population management goals - a desirable cumulative effect.

In the 2012-13 Missouri Deer Population Status Report and Deer Season Summary (MDC 2013) published by the Missouri Department of Conservation reports that white-tailed deer (*Odocoileus virginianus*) populations for northeast Missouri have been slowly declining over the last several years with dramatic declines experienced in a few counties, Pike County excluded. Even with the slow decline, resource scientists for MDC noted that Missouri has an abundance of deer with an estimated deer population of 1.4 million (MDC September 2013). The 2012 hemorrhagic disease outbreak is likely a result of the localized reductions in some areas, however recovery is expected to occur after a couple years.

With the overall deer populations in Missouri considered abundant and healthy, the estimated average harvest of 50 deer on Clarence Cannon National Wildlife Refuge will have minimal effect on the populations.

Non-Hunted Species
Non-hunted migratory birds include songbirds, wading birds, raptors, and woodpeckers. Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects would not be applicable to species that do not migrate such as most woodpeckers, and some songbirds including nuthatches, finches, and chickadees. Disturbance from hunting to non-hunted migratory birds should not have cumulative negative impacts since the hunting seasons would not coincide with the nesting season, and disturbance to the daily wintering activities, such as feeding and resting, of birds would probably be similar to that caused by non-consumptive users.

Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Non-hunted wildlife would include small mammals such as voles, moles, mice, and shrews; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory butterflies and moths, these species have very limited home ranges and hunting of allowed species would not affect their populations regionally.

Some species of butterflies and moths are migratory. Cumulative effects to these species at the "flyway" level should be negligible. These species are in torpor or have completely passed through the Clarence Cannon NWR by the hunting seasons. Any hunter interaction would be similar to that of non-consumptive users.

Disturbance to non-hunted wildlife would be unchanged under this Alternative. Significant disturbance would remain unlikely since small mammals are generally inactive during late November and early December and many of these species are nocturnal. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity when temperatures are low. Hunters rarely encounter reptiles and amphibians during most of the hunting season. Invertebrates are also not active during cold weather and have few interactions with hunters during the hunting season. Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

6.2.3.3 Threatened and Endangered Species

The Indiana bat, a Federally-listed endangered species, has not been documented on the Refuge, but has been observed using habitat along and adjacent to the Mississippi River. The presence of deer hunting on the Refuge would have little or no cumulative impacts due to the time of the year for the activity.

Decurrent false aster (Boltonia decurrens), a federally threatened species, has potential suitable habitat at the Clarence Cannon National Wildlife Refuge in Pike County, Missouri. Impacts to this species will continue be minimal since hunting at the Clarence Cannon NWR is conducted in the fall and winter, outside of the growing season.

6.2.3.4 Cultural Resources

Refuge hunting activities will not affect cultural resources under either Alternative so there will be no cumulative impacts to such resources.

6.2.3.5 Social and Economic Resources

With only deer hunting allowed under this Alternative, a slight increase in economic activity associated with this Alternative is expected. The current economic activity, while important to the communities near Refuge units (Section 6.1.5), is minor. Hunting activities under this Alternative will not produce significant cumulative effects.

The Refuge's presence increases the quality of life for some area residents. According to Refuge figures, in general, hunting accounts for more user visits than any of the other priority public uses, however at Clarence Cannon NWR, the priority public use is wildlife viewing. There are no other hunting-specific activities undertaken by the Service on the Refuge that have significant beneficial or adverse effects when compared to or combined with other socially important activities in the area. Refuge hunting activities under this Alternative does not produce significant cumulative effects.

6.2.3.6 Recreational Opportunities

Deer hunting activities implemented under this Alternative evaluated by this EA will provide recreational opportunities for Refuge visitors. These opportunities, while fully appreciated by Refuge users wishing to hunt, are important in the urban context where public hunting opportunities are limited. In a regional or statewide context, hunting on the Refuge units provides only a small percentage of hunting opportunities.

Non-hunting wildlife-dependent recreational opportunities are the priority public use on Clarence Cannon NWR and are available on a variety of other public or private lands locally. There are eight National Wildlife Refuges in Missouri. Thousands of other public spaces in the state provide a variety of wildlife habitat suitable for fishing, wildlife observation, photography, environmental education, and interpretation activities. Deer hunting activities at the Refuge under this Alternative will result in significant adverse effects at the local scale, due to the importance of the Refuge for non-consumptive priority public uses (i.e. wildlife observation, photography, interpretation, and environmental education).

6.2.3.7 Anticipated Impacts if Individual Hunts are Allowed to Accumulate

National Wildlife Refuges, including Clarence Cannon NWR, conduct hunting programs within the framework of state and federal regulations. By maintaining hunting regulations that are consistent with, or more restrictive than the State, individual refuges are maintaining seasons that are supportive of state and federal resource management goals. This Alternative would not increase the amount of hunting opportunity on Clarence Cannon NWR, therefore would not have any increased impact.

Table 6.3 – Comparison of Environmental Consequences by Alternative

Resource Impact	Alternative A (No Action, Preferred Action)	Alternative B
Compatible with the goals of the Refuge	Yes	No
Habitat	Minor impact such as trampling of vegetation in off-trail areas.	Minor impact such as trampling of vegetation in off-trail areas.
Wildlife	Impacts to significant concentrations of migratory waterfowl and deer herds will not change.	Disturbance to migratory waterfowl species and deer herds will increase causing negative impacts to their use of the refuge.
Non Game Species	No impacts	No impacts
Threatened and Endangered Species	No impacts	No impacts
Historic and Cultural Resources	No impacts	No impacts
Provides for priority public uses	Yes, satisfies the mandates of the 1997 Refuge Improvement Act.	Yes, satisfies the mandates of the 1997 Refuge Improvement Act.
Provides for simultaneous hunting and non-hunting activities	Yes	No
Recreational Use	No Change	Disturbance to resident species would increase. Migratory birds would be significantly impacted by the continued disturbance during the various deer hunts. Hunting recreational use will increase. Increased conflict between users would occur.
Meets the needs of partners and desires of the public	Yes	No

7.0 PREPARERS

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8.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONTACTED

Communities, Conservation Groups and Partner Organizations

- Claire McCaskill, U.S. Senator
- Roy Blunt, U.S. Senator
- Sam Graves, U.S. Representative
- Brian Munzlinger, Missouri State Senator, District 18
- Jim Hansen, Missouri House of Representative, District 40
- Missouri Department of Conservation
- U.S. Army Corps of Engineers

Print Media

- Bowling Green Times, Bowling Green, MO 63334, 573.324.2222, bgted@lcs.net
- Columbia Daily Tribune, Columbia, MO 65201, 573.815.1700, jerobertson@columbiatribune.com
- Elsberry Democrat, Elsberry, MO 63343, 573.898.2318, ebdreporter@sbcglobal.net
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- Louisiana Press Journal, Louisiana, MO 63353, 573.754.5566, lpjed@lcs.net
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U.S. Post Offices

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- Elsberry Post Office, 110 North Third Street, Elsberry, MO 63343
- Hannibal Post Office, 801 Broadway, Hannibal, MO 63401
- Louisiana Post Office, 522 Georgia Street, Louisiana, MO 63353
- Pittsfield Post Office, 129 South Madison Street, Pittsfield, IL 62363
- Quincy Post Office, 200 North Eighth Street, Suite 1, Quincy, IL 62301

Public Libraries

- Bowling Green Public Library, 201 W. Locust Street, Bowling Green, MO 63334
- Elsberry Public Library, 502 Broadway, Elsberry, MO 63343
- Hannibal Public Library, 200 South Fifth Street, Hannibal, MO 63401
- Louisiana Public Library, 121 North Third Street, Louisiana, MO 63353
- Pittsfield Public Library, 205 North Memorial Street, Pittsfield, IL 62363
- Quincy Public Library, 526 Jersey Street, Quincy, IL 62301

9.0 APPROVALS

Submitted by:

_____ _____
Jason Wilson, Project Leader Date

Concur:

_____ _____
Sabrina Chandler, Refuge Supervisor, Area 1 Date

_____ _____
Charlie Blair, Regional Chief Date
National Wildlife Refuge System

Approved:

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Thomas O. Melius, Regional Director Date
Region 3, U.S. Fish & Wildlife Service

APPENDIX A – REFERENCES

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APPENDIX B – CONSULTATION AND COORDINATION WITH OTHERS

The draft Environmental Assessment for the Clarence Cannon NWR hunt plan was released for public comment on August 25, 2014 for 30 days until September 25, 2014. The EA was available to all interested parties through the Clarence Cannon NWR website (http://www.fws.gov/refuge/clarence_cannon/). News releases were sent out to area newspapers, local libraries, and post offices. Letters were sent to other federal and state agencies and state and local officials.